REMARKS / AGRUMENTS

Applicant(s) respectfully traverse this rejection for the reasons set out below, and ask the Examiner for reconsideration.

Summary of the Office Action

Claims 1-4, 6-15, 17-20, and 22-27 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Applicant's admitted prior art (AAPA).

Claim 5, 16 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Romanowski (US 6,233,238).

Claim amendment

The subject matter of claims 3 and 5 was incorporated into amended independent claim 1.
The subject matter of claims 14 and 16 was incorporated into amended independent claim 12.
The subject matter of claims 20 and 21 was incorporated into amended independent claim 18.
Accordingly, dependent claims 3, 5, 14, 16, 20 and 21 where canceled.
Claims 13 and 15 where amended so as to depend upon independent claim 12.

No new matter is introduced by this amendment.

A discussion of the invention claimed by the applicants

The invention which is claimed by the applicants, and as opposed to prior art systems which are disclosed in the applicant's admitted prior art (hereinafter, AAPA), performs the timing recovery of multiplex of at least two media packet streams without performing a per-program synchronism. The transmitter and receiver are not required to synchronize to the time base of the any of the programs, and that, especially, there is **no** need to separately synchronize to each different time base.

As detailed in the patent application, the lack of synchronicity per media stream reduces the complexity of both transmitter and receiver – in comparison to prior art solutions such as those discussed at the AAPA – especially by reducing the amount of phase-locked loops (PLLs) that are required for transmitting a multiplex of multiple media packet streams that have different time bases,

According to the teaching of the invention, a transmitter timestamp unit of the transmitter side attaches a transmitter timestamp to each media packets that belong to the multiplex which is received from the low jitter source, and, it should be stressed, not to packets of any single program, which is known in the prior art and is described in the AAPA.

Conveniently, the timestamped media packets are then conveniently encapsulated into a high layer protocol compliant packet, such as Ethernet packet, IP packet and the like, wherein, and again as opposed to prior art solutions which are detailed in the art, these high layer communication protocols **do not** include RTP protocol.

Please note that each of the multiple single-program packet which are included in the multiplex packet may very well be associated with one of multiple time bases, in a process which is carried out by the one or more **sources** of the multiplex, and **not** by the transmitter, in a process such as the one described in paragraph [0044] of the patent application.

The timestamps which are associated with the packets of the multiplex are **not** synchronized with the time bases of the multiple single-program transport stream packet, as disclosed in paragraph [0045] of the patent application, and as is specifically claimed in the independent claims amended.

The receiver, according to the teaching of the invention, needs then only to use the timing information – which is associated with media packets of the multiplex by the **transmitter** – in order to reconstruct the at least one timing violation compensated media packet steam, as disclosed in paragraph [0048] of the patent application. This reconstruction is intended for countering the jittering of communication channel 40, because once the original media packet stream is reconstructed, the decoder can use the time bases of the multiple single-program stream packets which where included in the multiplex by the **source** in order to time the different programs.

Once this reconstruction have been added, additional steps like extracting selected portions of the TVICC packets, and providing these portions to a buffering and retrieval unit, could be carried out; however, those steps, which may include buffering information which pertains to the different programs, is responsive to the time bases which where provided by the **source**, and **not** by the transmitter.

A discussion of prior art solutions which are discussed at the AAPA

The prior art solution which is discussed in relation to figure 1 (paragraphs [0017 - 0026]) includes a transmitter which differs from the one claimed by the applicants by, among other differences, including: (a) A PID switch and splicer, which is adapted to separate the different programs from each other, so as to receive independent time bases, (b) an **array** of transmitter PLLs, and (c) an **RTP packet generator**; and a receiver which differs from the one claimed by the applicants by, among other differences, including: (a) **RTP** splicer, (b) a PID switch which is adapted to separate the different programs from each other prior to the timing correction, and (c) an **array** of receiver PLLs.

The separation of the different programs both by the transmitter and by the receiver is carried out by the prior art solution in order to allow the generation of RTP timestamps that are synchronized with the time base of **each** program. **Multiple** RTP timestamps are provided to RTP packet generator from the multiple transmitter PLLs, while the transport packets are provided to the RTP packet generator from the PID switch and splicer (paragraph [0018]).

A main difference that should be noted between the invention claimed by the applicant and the prior art solution is that the time bases of the multiple single-program transport feeds are achieved by way of program clock references (PCR), and does **not** include a different PLL timing which is associated with each of the programs.

As detailed in the application, it is the generation and timing responsively to the multiple PLL which is costly in many aspects - PLLs have complex filters and consume processing power, especially as they have to handle high jitter and changing delays introduced by the timing violation inducing communication channels

(paragraph [0025]) – and avoidance of which is achieved by the invention claimed by the applicants.

Discussion of the rejection of the independent claims under 35 U.S.C 102(b)

Claim 1-4,6-15,17-20, and 22-27 stand rejected under 35 U.S.C. 102(b) as being allegedly anticipated by Applicant's admitted prior art (hereinafter, AAPA).

It should be noted that the subject matter of claims 3 and 5 was incorporated into claim 1, that now claims:

> *A system for compensating for timing violations of a multiplex of at least two media packet streams, the system comprises:*
>
> *a transmitter, operable to receive the multiplex, to associate transmitter timing information to media packets that belong to the multiplex, and to transmit the media packets and the associated transmitter timing information towards a receiver, over a timing violation inducing communication channel; wherein the transmitter comprises a transmitter time base generator that is adapted to generate the transmitter timing information without synchronizing to any to time bases associated with the media packet streams; whereas the at least two media packet streams are associated with multiple time; and*
>
> *a receiver, operable to receive the transmitter timing information and the media packets, and to provide at least one timing violation compensated media packet stream in response to the transmitter timing information.*

As for claim 1, the examiner argues that the AAPA shows:

compensating for timing violations of a multiplex of at least two media packet streams, by a system which comprises: a transmitter, operable to receive the multiplex, to associate transmitter timing information to media packets that belong to the multiplex (a reference is made to paragraph [0015]), and to transmit the media packets and the associated transmitter timing information towards a receiver [0014], over a timing violation inducing communication channel [0015]; whereas the at least two media packet streams are associated with multiple time bases (Figure 1, MPTS

#31, [0018]); and a receiver (Figure 1 #50), operable to receive the transmitter timing information and the media packets [0015], and to provide at least one timing violation compensated media packet stream in response to the transmitter timing information [0015].

Paragraphs [0014-0015] of the AAPA to which the examiner refers discuss the prior art real time protocol (RTP). As detailed in those paragraphs, however, according to RTP standards the timestamp embedded within an RTP packet **originating from a certain program** must be synchronized with the **time base of the program**. This allows for the receiver to time each packet which, as aforementioned, **originate from a certain program**, accurately according to the transmitter's timestamp so to remove network-induced jitter.

Paragraph [0018] of the AAPA is referred to by the examiner in the context of the at least two media packet streams being associated with multiple time bases. The multiplexing of multiple programs into a multiplex stream is indeed a part of the prior art, and is discussed in the AAPA under the same title. With that, it should be noted that the prior art system which is discussed in the referred part of the AAPA is **not** a system which resembles the one claimed by the applicants.

In the mentioned part of the AAPA a prior art system is discussed, wherein indeed the a multiplex (a multiple program transport stream (MPTS)) may have up to multiple (in the example given denoted as J) different programs, whereas each program has an independent time base. However, the system which is described in this part of the AAPA is adapted to produce multiple (J) RTP time bases, which require the programs to be separated, and the discussed prior art system than generates RTP timestamps for **each** of the separate programs by **multiple** PPLs of the transmitter in response to the timestamps of the single programs, to allow the that are synchronized with the time base of each program.

The system which is described in this part of the AAPA then is adapted to provide multiple timestamps to the multiple programs, rather than associating transmitter timing information which was generated by *a transmitter time base generator* of the transmitter *without synchronizing to any to time bases associated with the media packet streams* to media packets that belong to the multiplex. Moreover, the multiple

timestamps which are provided for the multiple programs are generated by multiple PPLs, in many multiple costly PPL processes, which is avoided according to the teachings of the invention of the applicants to avoid.

Therefore, it could be seen that those paragraphs (nor any other part of the AAPA) do not describe in any way neither a transmitter which is operable to receive the multiplex, to associate transmitter timing information to media packets that belong to the multiplex, and to transmit the multiple-program transport stream packets and the associated transmitter timing information towards a receiver, whereas the at least two media packet streams (which are, as mentioned above, comprised in the multiplex, and are not transmitted independently) are associated with multiple time bases and whereas the transmitter timing information is generated by a transmitter time base generator that is adapted to generate the transmitter timing information without synchronizing to any to time bases associated with the media packet streams; whereas the at least two media packet streams are associated with multiple time; nor a receiver which is operable to receive the transmitter timing information and the media packets, and to provide at least one timing violation compensated media packet stream in response to the transmitter timing information (which is, as mentioned above, associated with the media packets that belong to the multiplex, and not with the different single programs).

Therefore, claim 1 should be allow.

Claims 2, 4 and 6-11, which depend onto claim 1, should also be allowed.

The subject matter of claims 14 and 16 was incorporated into claim 12, so as to claim:

> *A system for reducing jitter of a multiple program transport stream, the system comprises:*
>
> *a transmitter, operable to receive the multiple program transport stream from a low jitter communication channel, to associate a transmitter timing information to the packets of the multiple program transport stream, and to transmit the packets of the multiple program transport stream and the associated transmitter timing information over a high jitter communication channel towards a receiver; wherein the transmitter comprises a transmitter time base generator that is capable of generating a transmitter time base*

without synchronizing to any of at least two different time bases of at least two media packet streams of the multiple program transport stream; and

a receiver, coupled to the transmitter over the high jitter communication channel, the receiver is operable to receive the transmitter timing information and the packets of the multiple program transport stream, and to provide at least one low jittered program in response to the transmitter timing information.

For the reasons which are discussed in relation to claim 1, it is clear that neither of the different prior art references discussed in the AAPA discloses a system resembling the one which is claimed by the applicants.

Therefore, claim 12 should be allow.

Claims 13, 15, and 17, which depend onto claim 12, should also be allowed.

The subject matter of claims 20 and 21 was incorporated into claim 18, so as to claim: *A method for compensating for timing violations of a multiplex of at least two media packet streams, the method comprising the steps of:*
(a) generating the transmitter timing information, wherein the step of generating does not involve synchronizing to a time base associated with any of the media packet streams; (b) receiving the multiplex; (c) associating transmitter timing information to media packets that belong to the multiplex; (d) transmitting the media packets and the associated transmitter timing information towards a receiver, over a timing violation inducing communication channel; whereas the at least two media packet streams are associated with different time bases; (e) receiving the transmitter timing information and the media packets; and (f) providing at least one timing violation compensated media packet stream in response to the transmitter timing information.

For the reasons which are discussed in relation to claim 1, it is clear that neither of the different prior art references discussed in the AAPA discloses a method resembling the one which is claimed by the applicants.

Therefore, claim 18 should be allow.

Claims 19 and 22-27, which depend onto claim 18, should also be allowed.

Discussion of the rejection of dependent claims under 35 U.S.C 102(b)

Claims 2, 13, and 19 stand rejected under 35 U.S.C 102(b).

The examiner argues that prior art systems and methods which are discussed in the AAPA show the system comprises a decoder for decoding the at least one timing violation compensated media packet stream (wherein a reference is made to paragraph [0017] of the patent application).

As aforementioned, the prior art system which is discussed in paragraph [0017] and in the following paragraphs which pertain to Figure 1 are systems which include an array of transmitter PLLs, and an RTP packet generator, at the transmitter end, and the matching components at the receiver end, apart from the decoder.

It is clear that many prior art systems include decoders, and that since, as argued expansively in relation to the independent claims, the systems and method claimed by the applicants are essentially different from the one discussed in relation to the prior art, the scope of claims 2, 13, and 19 is not disclosed in the prior art.

Therefore, claims 2, 13 and 19 should be allowed.

Claims 3, 14, and 20 stand rejected under 35 U.S.C 102(b).

It should be noted that the subject matter of claims 3 (as well as 5), 14 (as well as 16) and 20 (as well as 21) was incorporated into independent claims 1, 12 and 18 respectively.

The examiner argues that prior art systems and methods which are discussed in the AAPA show the system wherein the transmitter comprises a transmitter time base generator for generating the transmitter timing information (a reference is made to paragraph [0017, TX PLL]).

From the independent claims, it is clear that the transmitter timing information is associated to media packets that belong to the multiplex, whereas the timing information which is generated in the discussed prior art system by the array of transmitter PLLs pertains to a single program (cf. paragraph [0018] – transmitter PLL

26(j) receives timestamps of a single programs, to allow the generation of RTP timestamps that are synchronized with the time base of each program).

Therefore, claims 3, 14, and 20 should be allowed.

Similarly, for claims 4, 15 and 22, for which the examiner argues that the AAPA shows the system wherein the receiver comprises a phased lock loop (PLL, 56) for reconstructing the transmitter time base (a reference is made to paragraph [0017]), it is again evident that the PLLs of the receiver are correspondingly adapted to reconstruct the single-program packets in response to timing information, and **not** transmitter timing information which is associated to media packets that belong to the multiplex.

Therefore, claims 4, 15, and 22 should be allowed.

Claims 6 and 23 stand rejected under 35 U.S.C 102(b).

The examiner argues that the AAPA shows a system wherein the transmitter is operable to encapsulate said media packets and the transmitter timing information in a communication channel format packets (a reference is made to paragraph [0015]).

Paragraph [0015], like other paragraphs of the same section of the AAPA, pertains to systems and methods wherein the timestamps pertaining to a certain program must be synchronized with the time base of the program.

Therefore, even without the additional restriction of claims 7 and 24 (wherein the communication channel format packets are specifically claimed not to comprise RTP compliant headers), the prior art reference does not discuss transmitter timing information that is associated to media packets that belong to the multiplex.

Therefore, claims 6 and 23 should be allowed

Similarly, as for claim 8 which stands rejected as the examiner argues that the AAPA shows the system wherein the transmitter is operable to include the transmitter timing information within a communication channel format packet header (wherein a reference is made to the same paragraph [0015]), the prior art reference similarly

does not discuss transmitter timing information that is associated to media packets that belong to the multiplex.

Therefore, claim 8 should be allowed.

Claim 27 stand rejected under 35 U.S.C 102(b).

The examiner argues that as for claim 27, the AAPA shows a system according to claim 1, wherein the multiplex is received over a low jitter communication channel (a reference is made to paragraph [0015]).

The applicants respectfully maintain that neither in paragraph [0015] nor elsewhere in the AAPA any discussion of a method (nor of a system) which comprises receiving the multiplex over a low-jitter communication level, and that all references to jitter in the discussion of the prior art systems and method is exclusively network induced jitter.

Therefore, claim 27 should be allowed.

Discussion of the rejection of dependant claims under 35 U.S.C. 103(a)

Claims 5, 16 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Romanowski (US 6,233,238).

It should be noted that the subject matter of claims 5 (as well as 3), 16 (as well as 14) and 21 (as well as 20) was incorporated into independent claims 1, 12 and 18 respectively.

The examiner argues that the AAPA shows that the transmitter time base generator is capable of generating a transmitter time base [0018], but do not show the restriction of generating the transmitter time base without synchronizing to any to time bases associated with the media packet streams. The examiner argues that this restriction could be learnt from Romanowski, which show without synchronizing to any to time bases associated with the media packet streams (Col. 2, line 37-45).

The applicants respectfully argues that one can not learn from Romanowski, nor with the AAPA in view of Romanowski, a generation of a transmitter time base without synchronizing to any to time bases associated with the media packet streams.

Romanowski discloses a system which is adapted to **update** timestamps of the PCRs of the **single programs** which are included in the MPTS, and does not describe **generation** of any kind, all the more so, Romanowski does not describe a system which is adapted to **generate** transmitter time bases pertaining to the **media packets that belong to the multiplex**.

The applicant claims that in order to establish a **prima facie** case of **obviousness**, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The applicants further argue that the examiner did not establish a prima facie case of obviousness to combine the prior art reference of Romanowski with the AAPA, and specifically, that the prior art references (separated or combined) do not teach or suggest all the claim limitations.

Claim 1, which now further incorporates the subject matter of claims 3 and 5, read:

> *A system for compensating for timing violations of a multiplex of at least two media packet streams, the system comprises:*
>
> *a transmitter, operable to receive the multiplex, to associate transmitter timing information to media packets that belong to the multiplex, and to transmit the media packets and the associated transmitter timing information towards a receiver, over a timing violation inducing communication channel; wherein the transmitter comprises a transmitter time base generator that is adapted to generate the transmitter timing information*

without synchronizing to any to time bases associated with the media packet streams; whereas the at least two media packet streams are associated with multiple time; and

a receiver, operable to receive the transmitter timing information and the media packets, and to provide at least one timing violation compensated media packet stream in response to the transmitter timing information.

As argued above, the AAPA does not teach of a system nor of a method which comprise a *transmitter time base generator for generating the transmitter timing information,* (which pertains, taken from the first paragraph above, to *media packets that belong to the multiplex) which is capable of generating a transmitter time base without synchronizing to any to time bases associated with the media packet streams.*
As neither does Romanowski teaches of a method which comprise a *transmitter time base generator for generating the transmitter timing information,* (which pertains, taken from the first paragraph above, to *media packets that belong to the multiplex) which is capable of generating a transmitter time base without synchronizing to any to time bases associated with the media packet streams*, a **prima facie** case of obviousness could not be establish.
Similarly, a **prima facie** case of obviousness could not be establish for claims 16 and 21.
Therefore, claims 5, 16 and 21 should be allowed.

Conclusion

The applicant believes that in view of these arguments claims 1-27 should be allowed.

Respectfully submitted,

Date: 1 October 2007 /Oren Reches/

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Reches Patents,

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